

REMARKS

Replacement drawing sheets for Figs. 1, 2, and 3 are enclosed. The through-holes in the brackets are depicted as threaded.

Claims 20 and 21 are amended to address the Examiner's objection.

The Examiner questioned the language of claim 5, "may assume are disposed" The wording is basically correct, although the wrong numerical form of the verb "to be" was used. The claim is amended to recite "is" rather than "are," and a comma has been added for clarity. Claim 5, in its entirety, recites, "The connector of claim 4 wherein the plurality of discrete positions that said cable interface may assume, are disposed within a range of 180 degrees of rotation about said coupling interface axis." A plurality of positions is disposed within 180 degrees. In particular, it is the plurality of discrete positions that said cable interface may assume, that is disposed within a range of 180 degrees.

Claim 15 is amended to correct the typographical error. The Examiner questioned to where the tool module is affixed. As recited in claim 15, the tool module is affixed to a robotic tool, such as welding tool, a deburring tool, a paint gun, or the like. Claim 15 is directed to a method of configuring a robotic tool for use on a robotic arm; it does not recite coupling the tool to the robotic arm by engaging the master and tool modules of a tool connector. Figure 6 corresponds to claim 15, and block 132 recites, "affix tool module including tool electrical connector to robotic tool."

Claims 1, 9, 15, 17, 18, and 19 are amended to recite a bracket, and to clarify the structural relationship of the electrical connectors to the bracket(s).

The foregoing amendments address all the Examiner's concerns and objections, and overcome the 35 U.S.C. § 112, second paragraph rejections.

The Examiner rejected claims 1-8 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,213,782 to Derstine. Derstine discloses a connector for coupling a PCMCIA connector on a PC card to an RJ modular plug or directly to a cable. The connector comprises

a first connection member 10 connectable to a PC card and several variations of a second connection member 20, 120, 220, 40 having a modular jack in a variety of orientations, or connected to the conductors of a cable. The second connection member is freely rotationally movable with respect to the first connection member. In some embodiments, a ledge 125, 225 on the second connection member engages a surface 18 on the first connection member to limit the rotation to above the axis 14 of the first connection member, col. 3, lines 31-38. This is the only limit on rotation that Derstine discloses. Otherwise, the connector is disclosed as free to pivot as forces induced by the connected cables dictate.

Derstine does not disclose every limitation of claim 1. Claim 1 recites a cable interface, connected to a bracket, that is moveable to a plurality of discrete positions with respect to the bracket. This is clearly depicted in Figure 3, and described at paragraph 0021:

While the cable interface 30 may rotate within the bracket 12 through approximately 180° of rotation about the cylindrical pin block 17, safety and reliability concerns dictate that the cable interface 30 be secured during use in one of a plurality of positions within its range of rotation. This is achieved by a retention member in the bracket 12 engaging one of a plurality of position-fixing recesses 60 disposed about the periphery of the rotatable block 32. In the embodiment depicted, the retention member is a set screw 64 disposed in a threaded-through hole 62. In operation, the set screw 64 is retracted to allow the rotatable block 32 to pivot about the cylindrical pin block 17 and the retention member 54 engaging the axial recess 50. Upon selecting the desired predetermined position for the cable interface 30 with respect to the bracket 12, the retention member 64 is actuated to mate with the selected position-fixing recess 60 to fix the position of the rotatable block 32.

Derstine does not teach or suggest that the rotation of the second connection member 20, 120, 200, 40 about the first connection member 10 is limited to a plurality of discrete positions.

Furthermore, the Examiner has failed to establish a prima facie case of obviousness, by failing to provide a legally sufficient suggestion or motivation to modify the connector of Derstine by mounting the bracket to a robotic tool changer master or tool module. The Examiner stated that such modification would have been obvious "since the instant invention does not provide any reason or a specific problem to be solved by having the connector to be mountable to the

robotic tool changer.” This is not the test for obviousness. “The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (emphasis added). There is not a scintilla of suggestion in Derstine, or in the art generally, to mount a rotatable, PMCCIA-to-RJ connector to the master or tool module of a robotic tool changer. That motivation derives solely and exclusively from claim 1.

“Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor.” *Para-Ordnance Mfg., Inc. v. SGS Importers Intern., Inc.*, 73 F.3d 1085, 1087 (Fed. Cir. 1995).

As discussed above and in the specification at paragraph 0021, the free rotation of the Derstine connector about its mating axis would render it unsuitable for use in a robotic tool coupling application. A prior art reference must be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443 (Fed. Cir. 1986).

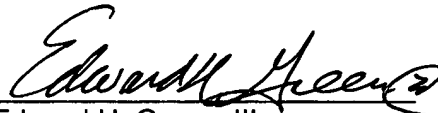
The Examiner rejected claims 20-23 under 35 U.S.C. § 103 as being unpatentable over Derstine in combination with U.S. Patent No. 1,649,951 to English. The claimed combination fails to teach or suggest every claimed limitation. Claim 20 recites a first multi-contact connector comprising a generally cylindrical pin block disposed in and secured to said bracket. Neither Derstine nor English disclose a cylindrical pin block. Derstine discloses (in some embodiments) two electrical connectors, neither of which is a pin block, much less a cylindrical pin block. Derstine discloses a PCMCIA connector comprising a linear array of electrical contacts arranged in a single or double row. col. 2, lines 40-43. Derstine also discloses a RJ-series modular jack with electrical contacts 31, 131, 231 aligned with corresponding electrical contacts on a RJ-series plug. Neither is a cylindrical pin block. English discloses no electrical connector at all.

The Examiner stated, "Although English does not use a setscrew, English solves the same problem." This is incorrect. As well understood by those of skill in the art, a set screw provides a significant sheer force in an application such as the set screw 54 in locking the rotating member 32 to a predetermined angular position. Once a position is selected and the set screw 54 inserted to "lock in" that position, only a catastrophic mechanical failure will release the member 32 to rotate to a different position. As discussed above in paragraph 0021, this is necessary for safety concerns on the factory floor. In stark contrast, the very purpose of English is to "permit the parts connected thereby to be easily adjusted in various angular relations to each other." It is clear by inspection to those of skill in the robotic arts that the mechanism of English would never pass muster in a robotic application. Thus, at least in the context of industrial robotics, the Examiner's assertion that the protrusion/recess mechanism of English is an equivalent or substitute for set screws inserted in threaded holes, fails to pass scrutiny.

All pending claims define patentably over the art of record. Accordingly, Applicant respectfully requests allowance of all pending claims.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.



Edward H. Green, III
Attorney for Applicants
Registration No.: 42,602

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P.O. Box 5
Raleigh, NC 27602
Telephone: (919) 854-1844